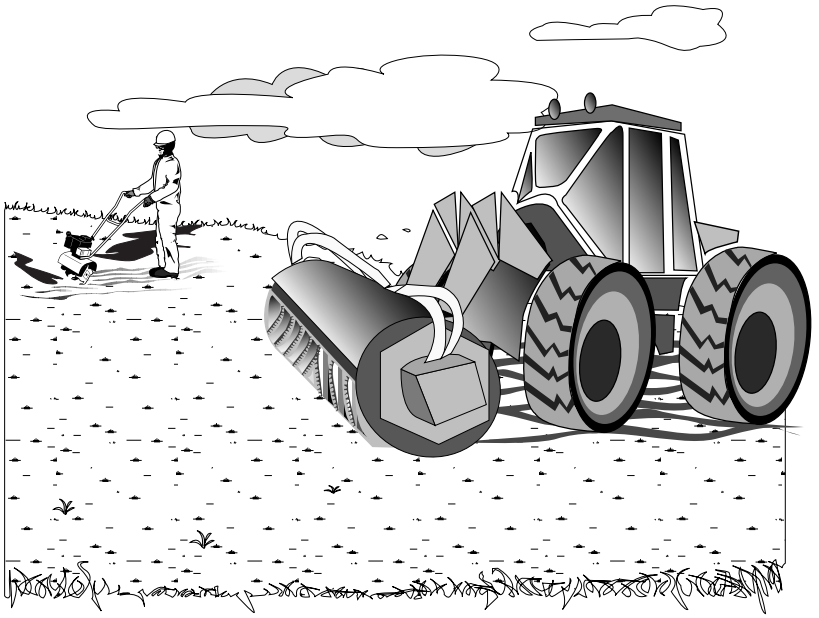

Tilling restores porosity and natural contours to tundra soils compacted by vehicle or foot traffic. Reworking contaminated soils can expose subsurface contamination and accelerate evaporation and other natural degradation processes. Tilling is appropriate after visible surface contamination and contaminated vegetation have been removed to the greatest extent possible.

The method of tilling will depend on size of the site. One person can use a rototiller in small, compacted areas. For larger areas, farm-type equipment such as discs, harrows, or plows may be needed. Earth moving equipment such as front-end loaders, graders, or bulldozers with scarifying or ripper teeth may also be used. Till deeply enough to mix and aerate the root mat and organic soil layer. After tilling, rake to re-establish soil contours, using surrounding tundra topography as a guide.

APPLICABILITY

- *Spilled Substance:* All
- *Tundra Types:* All
- *Season:* Spring, summer, fall

CONSIDERATIONS AND LIMITATIONS

- Tilling is best for sites where there has been both compaction and deep infiltration of persistent substances (diesel, crude oil).
- Tilling will greatly disturb plant cover. Use only if soil has been highly compacted.
- The objective of tilling is to expose contaminants and promote their degradation, and also to reduce compaction.
- This tactic may not be appropriate for sites where wind or water erosion is a threat.
- Use of vehicles and heavy equipment on tundra must comply with applicable tundra travel policies (Tactic P-5).
- It may be necessary to a suitable seed bed for active seeding and natural recolonization.
- Tilling is a tactic adapted for tundra treatment from temporal-zone agricultural practices and has been used with acceptable short-term results in North Slope wet and moist tundra treatment regimes (Burgess et al., 1996; Cater and Jorgenson, 1999). Information on the effectiveness of this tactic is based on field observations, not controlled experiments. No test data exist which document whether the use of this tactic results in long-term benefits to tundra restoration compared with other tactics, combinations of tactics, or “no action.”

EQUIPMENT, MATERIALS, AND PERSONNEL

- Rototiller (1 operator) – to rework and aerate soil
- Front-end loader (1 operator) – to rework and aerate soil
- Grader with scarifying teeth (1 operator) – to rework and aerate soil
- Dozer with ripper teeth (1 operator) – to rework and aerate soil
- Rake (1 operator per rake) – to contour tilled soil